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Willingness to compete in a gender equal society

BY

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Willingness to compete in a gender equal society

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A number of experimental studies have found that females are more competitively inclined than males, and it has been argued that this difference potentially can explain a wide range of real world economic phenomena, including observed gender differences in labor markets (Balafoutas and Sutter, 2012; Flory et al., 2010; Gneezy et al., 2003; Gneezy and Rustichini, 2004; Niederle and Vesterlund, 2007, 2011; Sutter and Rützler, 2010). Recent evidence suggests that the gender difference in willingness to compete largely reflects cultural norms, which has been seen as providing justification for gender equalizing public policies aiming at eliminating this asymmetry between males and females (Gneezy et al., 2009).

The Scandinavian countries have for a long time pursued such policies, and are today considered among the most gender equal societies in the world; in fact, Norway ranks highest on the UN gender equality index comprising measures of educational attainment, labor market participation and health.[1] Still, in a large lab experiment conducted with adolescents in Norway, we find a substantial gender difference in the willingness to compete, in line with what has been observed in Sweden (Cárdenas et al., 2012). We argue that these observations from Scandinavia provide a challenge to the gender policy debate, namely how to view preference differences in free and gender equal societies. Economists have traditionally assigned great importance to respecting individual preferences, as exemplified by the recent literature on libertarian paternalism (Sunstein and Thaler, 2008), but have been more willing to consider policies that nudge people in a particular direction if this is to overcome a particular behavioral bias, for example when individuals hold incorrect beliefs about their own abilities.

A related important policy question is whether the gender difference in willingness to compete reflects that females compete too little or males compete too much. Clearly, the answer to this question will be crucial in determining the extent to which public policies in this area should target females or males. But this is not a straightforward problem to

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[1] http://hdr.undp.org/en/statistics.

analyze, since the decision of whether or not to enter into competition typically involves important uncertainties: an individual may be unsure about her own ability to perform and about the level of competition. In such a complex choice situation, what should be the metric for whether a person should have competed or not? And how should we measure the corresponding economic gains or costs of making any particular choice?

The present paper addresses these issues, where we report from the above-mentioned lab experiment conducted on a representative sample of Norwegian adolescents, 14 to 15 years old. We show that even though the long history of gender equalizing policies in Norway has not eliminated gender differences in willingness to compete, it appears to have made young males and females similar in a wide range of other domains. In particular, we do not find any gender difference in confidence. Our study opens up for two very different policy responses. One response is to argue that the data provides evidence for gender equalizing policies being very successful, and consequently view a continuation of such policies as an appropriate strategy to remove the difference in willingness to compete. Alternatively one might argue that the apparent success of these policies should be taken as evidence for males and females being treated as equals in Norway, and thus view it as appropriate to respect any remaining gender differences in preferences.

The second contribution of the paper is to show that the choice of metric for measuring whether a person should have competed or not is important. We consider two possible approaches, the ex post approach and the ex ante approach. When applying the ex post approach, we find, in line with the existing literature (Niederle and Vesterlund, 2007), that too few females compete (under-entry) and too many males compete (over-entry). If, however, we take the ex ante approach, we find that there is substantial under-entry into competition both among males and females (measured relative to what would maximize an individual's expected income). In fact, with this approach, we find hardly any evidence of over-entry among the participants. With both approaches, we find that females are significantly less willing to exploit the potential gains from competition, and this remains the case even when controlling for confidence, risk preferences, and other experimental variables. This suggests that differences in preferences for competition are fundamental in explaining gender differences in outcomes.

1 Sample and design

Our sample is 9th grade students in Norway, who were recruited from randomly selected schools in Bergen municipality, which is largely representative for Norway. At each school, we randomly selected some classes, and all students in these classes received a personal invitation to participate in the experiment. Out of 603 invited students from nine schools, 523 took part in the experiment, giving us a mean participation rate of 87%. Since the 9th grade is compulsory in Norway, with hardly any dropout, we consider the sample to be representative for this age group in Norway.[2] To ensure control over the experimental situation, all participants were transported by bus from their schools to a lab at NHH Norwegian School of Economics. On average 50 students participated in each

[2]This is confirmed by what we find when comparing family background data for our sample with national data. The distribution of income and education of the parents to the participants in our sample is in line with official statistics for Norway. For a more detailed discussion of this issue, see Almås et al. (2012).

session and we had ten sessions that lasted for approximately two hours.

The experimental design used to measure preferences for competitiveness is similar to the design in Niederle and Vesterlund (2007).[3] Participants were asked to add sets of four two-digit numbers over a three-minute period and they earned one point for each correct answer. After receiving the instructions about the real effort task, but before working on it, the participants were asked to state the fraction of participants they believed would do better than themselves on the task. The difference between the participant's response and his or her actual performance gives us an individual measure of overconfidence.

The real effort task was done twice, in each round lasting for three minutes. In the first round, the participants worked under a competitive tournament scheme, where they earned 50 NOK (approximately 8.5 USD) if they got at least as many point as the average score in the same session, otherwise, they received nothing. Without receiving any feedback on their own or others productivity in the first round, they were then told to do the same task again. This time they were asked to choose between a fixed piece rate of 1 NOK per correct answer or a competitive pay, where they received 3 NOK per correct answer if they scored at least as many points as the average in the first round.

In addition to the experiment designed to measure competitiveness, we also conducted other experiments that measured the participants' risk preferences, time preferences and social preferences. After all the incentivized parts of the experiment were completed, participants also answered the 44-item Big Five Inventory (John et al., 1991). All payments, except payments from the time preference experiment, were made in cash at the end of the session, and special care was taken to ensure anonymity in the payment procedure.

2 Results

From Table 1, we observe that 41 percent of the participants in our sample choose to compete. Males are considerably more likely to select into competition than females, 51.1 percent versus 31.0 percent. This large difference is striking in light of the fact that we find only a small difference in the performance of males and females on the experimental task, and no significant gender differences in any of the other experimental variables. In particular, females are as overconfident as males, and there are also no gender differences in risk preferences, time preferences or social preferences. Thus, Table 1 may be seen as providing evidence for the long history of gender equalizing policies in Norway making females and males very similar, except with respect to willingness to compete.

An important question, in light of the striking gender difference in selection into competition, is whether this reflects that females compete too little or males compete too much. In studying this question, we follow Niederle and Vesterlund (2007) and focus on whether the participant decided to compete when doing so would maximize his or her income. We use two different approaches to determine the metric in this analysis, the ex post approach and the ex ante approach. The ex post approach defines that a person should have competed if his or her performance in the second round was greater than the average performance in the first round (which was the benchmark in the competition), whereas everyone who performs worse in the second round should have chosen not to compete. Panel A in Table 2 shows the number of participants, broken down by gender,

[3]Experimental instructions can be found in a web-appendix.

Table 1: Overview of gender differences

	mean		standard deviation		p-value	
	Males	Females	Males	Females	(equal means)	N
Variables pertaining to the competition experiment						
Compete	0.511	0.310	0.501	0.463	< 0.001	523
Performance	10.95	9.71	4.92	4.36	0.003	523
Overconfidence	0.041	0.086	2.76	2.97	0.857	523
Other experimental measures						
Risk	3.64	3.59	2.31	2.18	0.802	523
Patience	8.45	8.27	3.95	3.75	0.600	523
Egalitarian	0.280	0.259	0.450	0.439	0.588	523
Altruism	0.300	0.322	0.246	0.229	0.311	517

Note: "Compete" is an indicator variable (1: participant chose to compete, 0: participant did not compete), "Performance" indicates how many correct answers the participant had in the real-effort task in the first round, "Overconfidence" indicates the difference between what the participant believes about own performance and actual performance (reported in deciles) "Risk" indicates how many times the gamble was chosen over the certain alternative, "Patience" indicates how many times the participant chose to wait when choosing between money amounts spaced three weeks apart, "Egalitarian" is an indicator variable (1: the participant, as a spectator, shared equally between two players with different production in a dictator game, 0: the participant did not share equally), "Altruism" is the share given to another participant as dictator in a situation with equal production, where the slightly lower number of observations reflects matching problems in session with odd number of participants.

who, according to the ex post approach, should and should not have chosen to compete, where we observe that over-entry is more common for males and that under-entry is more common for females.

This ex post classification does, however, not take account of the fact that the participants made their decision under uncertainty about own performance and about the performance of others. The ex ante approach, on the other hand, takes this uncertainty into account, and defines that a person should have competed if this maximized the participant's expected income.[4] From Panel B in Table 2, we observe that the ex ante approach provides us with a very different picture of the selection into competition than the ex post

[4]The expected income from choosing to compete is given by

$$\sum_y \sum_x 3y \cdot P_i(Y_2 = y) P(\overline{Y}_1 = x) 1(y \geq x),$$

where $P_i(Y_2 = y)$ is the probability for the participant's production in round two Y_2 being equal to y and $P(\overline{Y}_1 = x)$ is the probability for average production in round one being x, and $1(\cdot)$ is the indicator function. To evaluate a normal approximation of $P(\overline{Y}_1 = x)$, we use the standard error of the mean in each session in the first round; to evaluate $P(\overline{Y}_1 = x)$, we estimate a Poisson count model on the performance data for both rounds, where we include dummies for gender and whether a person worked under a competitive tournament scheme, and the interaction between these variables. The estimated Poisson count model can also be used to evaluate the the expected income from working for a fixed piece rate, which is given by

$$\sum_y y \cdot P_i(Y_2 = y).$$

Table 2: Under- and overentry into competition

	Should compete			
	Males		Females	
A. Chose to compete (ex post)	no	yes	no	yes
no	72	59	98	78
yes	47	90	23	56
B. Chose to compete (ex ante)				
no	21	110	30	146
yes	10	127	4	75

Note: The panels show how many participants who chose to compete and how many participants who chose not to compete, by whether they should have competed. A person is said to should have competed if doing so would have maximized ex post income given the actual performance in the second round and the actual average performance in the first round (Panel A), or if this would have maximized expected income according to the model outlined in footnote 4 (Panel B).

approach, showing substantial under-entry among both males and females. Further, with the ex ante approach, we find hardly any evidence of over-entry among the participants. The explanation for the stark difference between these two approaches is that by taking into account the uncertainty involved in choosing competition, the nonlinear structure of the payoff scheme becomes important. In particular, in expected income terms, a small probability of succeeding in the competition might outweigh a higher probability of failing. Consequently, even participants who expect to perform worse in round two than the average performance in round one may maximize their expected income by choosing competition.

The ex ante approach and ex post approach support very different conclusions about the male participants, the ex ante approach suggests that males, on average, compete too little, whereas the ex post approach suggests that males, on average, compete too much. For the females, however, the two approaches coincide and both support the conclusion that females, on average, compete too little. Clearly, both approaches also show that under-entry is a greater problem among females than males, which means that females to a lesser extent than males take advantage of the potential gains from entering into competition.

We now turn to a discussion of how the gains or losses associated with the choice of whether to compete or not are associated with gender, confidence, and background variables. Also when evaluating gains and losses, we adopt both the ex ante approach and the ex post approach. The ex post approach measures the gain as the difference between the income from the alternative chosen and the income from the alternative not chosen, assuming that the performance would have been the same for both alternatives. The ex ante approach, on the other hand, measures the gain as the difference between the expected income from the alternative chosen and the expected income from the alternative not chosen. Table 3 reports regressions of the gains from the competition choice on gender and different background variables.

We observe that independent of which approach we apply and whether we include

Table 3: Gains from competition choice

	Ex ante gains			Ex post gains		
	(1)	(2)	(3)	(4)	(5)	(6)
female	-5.929***	-5.433***	-5.805***	-4.223**	-3.659*	-4.025**
	(1.502)	(1.475)	(1.481)	(1.944)	(1.923)	(2.005)
overconfidence		0.832*	0.681		1.121*	1.000
		(0.448)	(0.463)		(0.610)	(0.646)
Female × overconfidence		1.749***	1.690***		1.481**	1.475**
		(0.554)	(0.554)		(0.676)	(0.686)
Additional controls:						
Experimental controls	no	no	yes	no	no	yes
Observations	523	523	523	523	523	523
R^2	0.234	0.278	0.313	0.138	0.170	0.193

Note: The dependent variable is the difference between the income from the alternative chosen minus the income from the alternative not chosen. In (1)-(3), this is measured in expected income, as outlined in footnote 4, whereas in (4)-(6) it is measured in ex post income. The experimental controls are those listed in Table 1: Risk preferences, time preferences, and social preferences, in addition to the personality measures from the Big-5 inventory. Also included, but not reported, are fixed effects for each level of round one performance and an indicator variable for missing observations on social preferences. Standard errors in parentheses (* $p < 0.10$, ** $p < 0.05$,*** $p < 0.01$).

controls for individual beliefs and other background variables, we estimate a significant loss for the females. We interpret this loss as capturing the economic cost of the observed gender difference in willingness to compete. Interestingly, we also observe that being overconfident, particularly for females, is beneficial, which reflects that overconfidence counteracts the general tendency of under-entry into competition.

3 Policy dilemmas

The results from our experiment show that there is a substantial difference in the willingness to compete among adolescent males and females in one of the most gender equal societies in the world. We have also shown that this gender difference reduces the girls' economic gain from the experiment. Potentially, this pattern may also repeat itself outside the lab where these adolescents soon are to make important educational and career choices. What should be the policy response to this scenario?

We argue that our analysis highlights two fundamental questions in the debate about gender equalization policies in liberal societies. The first question is to what extent it is legitimate to design policies that aim to eliminate gender differences in preferences for competition. How we answer this question might depend on the true nature of individual preferences and the role of society in shaping our preferences. While many would find it illegitimate to manipulate preferences if they are fully autonomous, such paternalistic interventions might be more legitimate if preferences to a large extent are shaped by family background, peer pressure, and other circumstances. The second question is to what ex-

tent it is legitimate to manipulate individuals' beliefs about their own abilities. The answer to this question is likely to depend on whether peoples' beliefs are correct or not. While it seems possible to reconcile the ideals of a liberal society with manipulations that make beliefs more correct, there seems to be a fundamental tension between liberal ideals and manipulations that make peoples' beliefs less correct. The results from our experiment point to the possibility that manipulating people to become overconfident might improve economic outcomes by counteracting a tendency to compete too little. Such possibilities create situations where there is a difficult trade-off between liberal ideals and economic outcomes.

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